

## **REMARKS**

### **I. General**

Claims 1-25 are pending in the present application. The present Office Action (mailed September 20, 2006) rejects all of claims 1-25 and raises the following issues:

- Claims 1-3, 5, 7-9, and 15-25 are rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Publication Number 20030110429A1 to Bailis et al. (hereinafter “*Bailis*”);
- Claims 4 and 6 are rejected under 35 U.S.C. §103(a) as being unpatentable over *Bailis* in view of U.S. Patent No. 5,287,617 to Murphy (hereinafter “*Murphy*”);
- Claim 10 is rejected under 35 U.S.C. §103(a) as being unpatentable over *Bailis* in view of U.S. Patent No. 5,530,706 to Josephson et al. (hereinafter “*Josephson*”);
- Claims 11-14 are rejected under 35 U.S.C. §103(a) as being unpatentable over *Bailis* in view of *Josephson* and further in view of U.S. Patent No. 4,558,422 to DenBeste et al. (hereinafter “*DenBeste*”); and
- The abstract of the disclosure is objected to.

Applicant respectfully traverses the outstanding claim rejections raised in the current Office Action, and requests reconsideration and withdrawal thereof in light of the amendments and remarks presented herein.

### **II. Claim Amendments**

Claims 1, 15, and 21 are amended herein. No new matter is added by these amendments.

Claim 1 is amended to specify that the recited at least one input pin of said programmable capture device is communicatively coupled to at least one “externally-accessible” signal pin of said first device.

Claim 15 is amended to specify that the “capturing data” is from “an externally-accessible signal pin of said first device” by a separate field-programmable data capture device that is also arranged on the circuit board with the first device.

Claim 21 is amended to specify that the recited means is “external to said first means” and is for capturing signals from “an externally-accessible pin of said first means”.

### **III. Rejections Under 35 U.S.C. §102**

Claims 1-3, 5, 7-9, and 15-25 are rejected under 35 U.S.C. §102(e) as being anticipated by *Bailis*. To anticipate a claim under 35 U.S.C. § 102, a single reference must teach every element of the claim, *see* M.P.E.P. § 2131. Applicant respectfully traverses this rejection because *Bailis* fails to teach all elements of claims 1-3, 5, 7-9, and 15-25, as discussed below.

#### **Independent Claim 1**

Independent claim 1 recites:

A system comprising:  
a first device arranged on a circuit board; and  
a programmable capture device arranged on said circuit board, wherein at least one input pin of said programmable capture device is communicatively coupled to at least one externally-accessible signal pin of said first device such that said programmable capture device captures at least one signal from said first device during testing of said first device.

*Bailis* fails to teach all of the above elements of claim 1. For instance, *Bailis* fails to teach a programmable capture device that is communicatively coupled to at least one externally-accessible signal pin of a first device arranged on a circuit board. Rather, *Bailis* is directed to an ASIC that includes an internal programmable device for capturing signals within the ASIC that

are not accessible via an externally-accessible signal pin of the ASIC. For instance, *Bailis* explains in paragraph 0003:

In today's test environment, application specific integrated circuits (ASICs) are extremely dense with various functions while having a limited number of I/O pins with respect to those functions. Often, there are significant, complex functions connected with only internal ASIC buses and signal paths, which are not exposed via an I/O pin. Further, due to the density and complexity of functions, it would not be practical to bring out all needed functions for observation and control, as this would result in potentially thousands of I/O pins.

Paragraphs 0012 and 0013 of *Bailis* further explain:

Historically, functional entities were embodied in multiple modules with an exposed bus and signal paths between the modules. This enables the use of logical analyzers, logic debuggers and like tools to be used to observe and control the system. With the advent of integration techniques, multiple modules and their interconnections are now placed inside a single chip, often an ASIC. Because of this integration, the use of these tools (external logical analyzers, logic debuggers and like tools) is not possible with today's ASICs, as there is no physical method available to place the tools on an internal-to-the-ASIC bus and no method to disconnect and tie up or down internal-to-the-ASIC signal paths to provide the observation and control of the functions.

Accordingly, what is needed is a system and method for allowing the observation and control of an ASIC that allows for placing tools internal to the ASIC without requiring additional I/O pins. The system should be easy to implement, cost effective and easily adaptable to standard cell IC design tool. The present invention addresses such a need.

Thus, *Bailis* is concerned with observing internal signals of an ASIC that are not sent outside the ASIC via an I/O pin of the ASIC. *Bailis* is not concerned with capturing signals from an externally-accessible pin of a device, which may in some instances (as discussed in the present application) contain many (e.g., thousands) of I/O pins.

Accordingly, in view of the above, Applicant respectfully submits that the rejection of claim 1 should be withdrawn.

Independent Claim 15

Independent claim 15 recites:

A method comprising:  
triggering testing of a first device arranged on a circuit board; and  
capturing data from an externally-accessible signal pin of said first device  
during said testing by a separate field-programmable data capture device also  
arranged on said circuit board.

*Bailis* fails to teach all of the above elements of claim 15. For instance, *Bailis* fails to teach capturing data from an externally-accessible signal pin of a first device by a separate field-programmable data capture device that is arranged on a circuit board. As discussed above with claim 1, *Bailis* proposes a programmable data capture device that is arranged internal to an ASIC for capturing internal signals of the ASIC that is not accessible via an externally-accessible signal pin of the ASIC.

Accordingly, in view of the above, Applicant respectfully submits that the rejection of claim 15 should be withdrawn.

Independent Claim 21

Independent claim 21 recites:

A system comprising:  
a first means for performing an operation, wherein said first means is  
arranged on a circuit board; and  
a means external to said first means, arranged on said circuit board, for  
capturing signals from an externally-accessible pin of said first means during  
testing of said first means, wherein the capturing means is programmable while  
arranged on said circuit board.

*Bailis* fails to teach all of the above elements of claim 21. For instance, *Bailis* fails to teach a programmable means that is external to a first means and that is arranged on a circuit board for capturing signals from an externally-accessible pin of the first means, as recited by claim 21. As discussed above with claim 1, *Bailis* proposes a programmable data capture device

that is arranged internal to an ASIC for capturing internal signals of the ASIC that is not accessible via an externally-accessible signal pin of the ASIC.

Accordingly, in view of the above, Applicant respectfully submits that the rejection of claim 21 should be withdrawn.

#### Dependent Claims

Dependent claims 2-3, 5, 7-9, 16-20, and 22-25 each depend either directly or indirectly from respective independent claims 1, 15, and 21 and, thus, inherit all of the limitations of their respective independent claims. It is respectfully submitted that dependent claims 2-3, 5, 7-9, 16-20, and 22-25 are allowable at least because of their dependence from their respective base claims for the reasons discussed above. Accordingly, Applicant respectfully requests the withdrawal of the rejection of claims 2-3, 5, 7-9, 16-20, and 22-25.

Further, dependent claim 2 recites further elements not taught by *Bailis*. For instance, dependent claim 2 recites “wherein said first device is arranged on a first side of said circuit board, and wherein said programmable capture device is arranged on a side of said circuit board opposite said first side.” *Bailis* fails to teach this further element of claim 2. Instead, *Bailis* teaches a programmable capture device that is arranged internal to an ASIC, and is not arranged on an opposite side of a circuit board from a first device (e.g., internal component of the ASIC) from which the programmable capture device captures signals.

Further, dependent claim 3 also recites further elements not taught by *Bailis*. For instance, dependent claim 3 recites “wherein said programmable capture device comprises pins having an arrangement corresponding to an arrangement of pins of the first device.” *Bailis* fails to teach this further element of claim 3. Instead, *Bailis* teaches that a programmable capture device is needed for arrangement internal to an ASIC for capturing signals that are not provided via I/O pins of the ASIC.

Further, dependent claim 5 also recites further elements not taught by *Bailis*. For instance, dependent claim 5 recites “wherein said programmable capture device has a density of

input pins on the order of signal pins of said first device.” *Bailis* fails to teach this further element of claim 5. Instead, *Bailis* teaches a programmable capture device that is arranged internal to an ASIC, and such internal programmable capture device does not include input pins having a density on the order of signal pins of the device from which it captures signals (e.g., some internal component of the ASIC).

#### **IV. Rejections Under 35 U.S.C. §103**

Claims 4 and 6 are rejected under 35 U.S.C. §103(a) as being unpatentable over *Bailis* in view of *Murphy*. Claim 10 is rejected under 35 U.S.C. §103(a) as being unpatentable over *Bailis* in view of *Josephson*. Claims 11-14 are rejected under 35 U.S.C. §103(a) as being unpatentable over *Bailis* in view of *Josephson* and further in view of *DenBeste*.

As shown above, *Bailis* does not teach every feature of independent claims 1, 15, and 21. Dependent claims 4 and 6 each depend either directly or indirectly from independent claim 1 and, thus, inherit all of the limitations of claim 1. Therefore, *Bailis* does not teach or suggest all claim limitations of claims 4 and 6. The Office Action does not rely on *Murphy* to teach or suggest the features shown to be missing from *Bailis*, nor does *Murphy* teach or suggest those features.

Dependent claim 10 depends from independent claim 1 and, thus, inherits all of the limitations of claim 1. Therefore, *Bailis* does not teach or suggest all claim limitations of claim 10. The Office Action does not rely on *Josephson* to teach or suggest the features shown to be missing from *Bailis*, nor does *Josephson* teach or suggest those features.

Dependent claims 11-14 each depend either directly or indirectly from independent claim 1 and, thus, inherit all of the limitations of claim 1. Therefore, *Bailis* does not teach or suggest all claim limitations of claims 11-14. The Office Action does not rely on *Josephson* and *DenBeste* to teach or suggest the features shown to be missing from *Bailis*, nor does *Josephson* and *DenBeste* teach or suggest those features.

In view of the above, it is respectfully submitted that dependent claims 4, 6, and 10-14 are allowable at least because of their dependence from their respective base claims for the reasons discussed above. Accordingly, Applicant respectfully requests the withdrawal of the rejection of claims 4, 6, and 10-14.

#### **V. Objection to the Abstract**

The Office Action objects to the abstract of the disclosure of the present application, and asserts that the abstract “is not describing the invention” and “is written like a claim would be”. Page 8 of the Office Action. However, the Office Action fails to explain how the abstract fails to describe the invention. Further, as discussed further below, the abstract is very limited in permitted word length and is not required to fully describe the invention.

Applicant respectfully submits that the abstract of the present application is sufficiently directed to the subject matter of the invention. “A patent abstract is a concise statement of the technical disclosure of the patent and should include that which is new in the art to which the invention pertains.” M.P.E.P. §608.01(b). However, the abstract is not intended to fully disclose all aspects of an invention, nor does it define the scope of the invention (rather, the claims define the scope of protection). Indeed, the abstract is limited such that it is not to exceed 150 words in length, *see* M.P.E.P. §608.01(b). Due to such constraints, the “abstract should not refer to purported merits or speculative applications of the invention and should not compare the invention with the prior art”, *see* M.P.E.P. §608.01(b).

The abstract of the present application currently provides:

According to at least one embodiment, a system comprises a first device arranged on a circuit board. The system further comprises a programmable capture device arranged on the circuit board, wherein at least one input pin of the programmable capture device is communicatively coupled to at least one signal pin of the first device such that the programmable capture device captures at least one signal from the first device during testing of the first device.

Applicant respectfully submits that this language is directed to the subject matter of the present invention, within the constraints that are placed on the abstract. Further, the Office

Action fails to explain why an abstract that is written like a claim would be objectionable. Further, the abstract is not written according to claim drafting rules. For instance, the abstract is not drafted as a single sentence. Also, the Office Action does not suggest any language that the Examiner believes would be appropriate to include in the abstract of the present application within the constraints (e.g., 150 word limit) placed on the abstract.

In view of the above, Applicant respectfully requests that the objection to the abstract be withdrawn.

## **VI. Conclusion**

In view of the above, Applicant believes the pending application is in condition for allowance.

Applicant believes no fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 08-2025, under Order No. 200210236-1 from which the undersigned is authorized to draw.

Respectfully submitted,

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